

Power Conditioning

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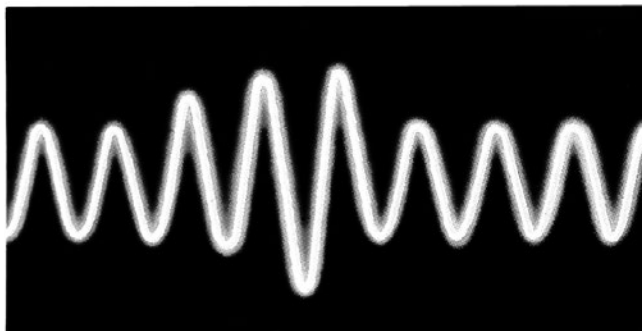
Selecting the Best Power Conditioning Devices/ Equipment for Your Application

Digital weighing indicators utilize an incredibly small signal in their operation. These signals are easily disturbed by any number of voltage distortions. Additionally, many weighing systems are now designed with a complex array of peripheral equipment, including printers and computers. To maintain proper operation and provide maximum protection, Rice Lake Weighing Systems offers a wide variety of power conditioning products as your first line of defense in the battle to improve power problems.

The following is a list of power problems you are likely to experience, with a reference to the equipment we recommend to solve each problem. A "quick reference" power conditioning equipment chart is also included for your convenience.

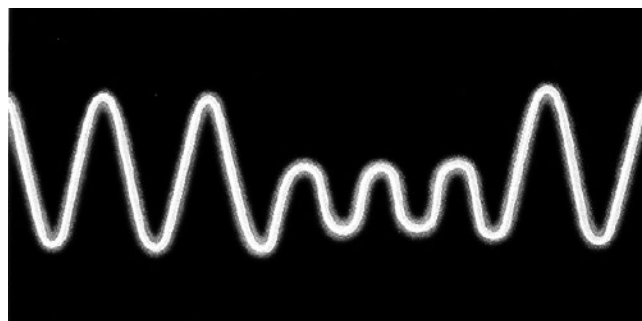
Voltage Surge

A voltage surge is a temporary rise in voltage level lasting at least one AC cycle (1/60 second). They are typically caused by switching off high-power electric motors (electric welders, compressors, machine tools, conveyors, material handling equipment and power tools), momentarily boosting the line voltage. Regulation of the line to an acceptable voltage level is required to prevent the damage caused by voltage surges. The SOLA MCR series of voltage regulators, MCR070, MCR150 and MCR250, are designed to keep the voltage level within acceptable and harmless limits.



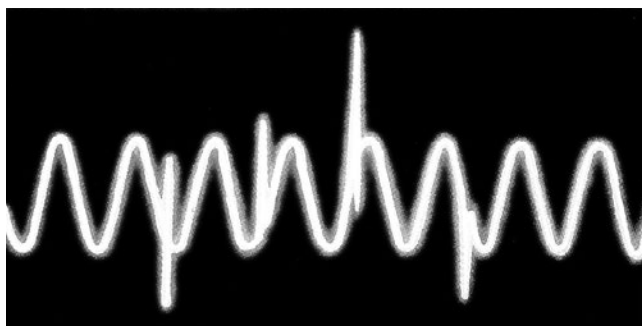
Voltage Dip

A voltage dip is the opposite of a voltage surge, lasting at least one AC cycle (1/60 second). They are typically caused by a sudden nearby increase in an electrical load, such as turning on high-power electrical motors (electric welders, compressors, machine tools, conveyors, material handling equipment and power tools). During this time, every other piece of operating equipment is forced to operate with the reduced available voltage. Regulation of the line voltage is required to remedy this situation. The SOLA MCR series of voltage regulators, MCR070, MCR150 and MCR250, solve your problem by temporarily boosting the line voltage to within acceptable limits until the voltage dip condition has corrected itself.



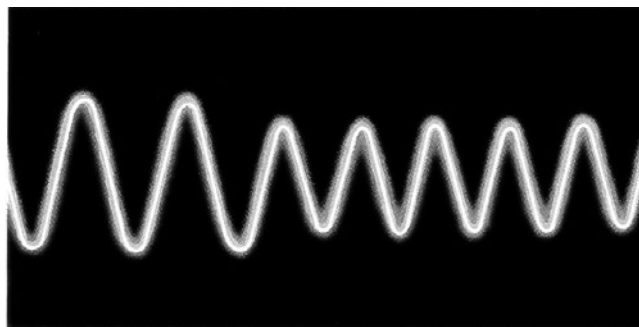
Voltage Spikes

A voltage spike is a large, damaging voltage pulse caused when lightning strikes a powerline, communications line, signal or sensing line, or even the nearby ground. Voltage spikes last only a few milliseconds, but can reach a potential of 1,000 volts. High-quality protection is the only practical answer. For RS-232, RS-485, RS-422 and 20mA communication lines, use the TP232. The UJB3T6, LCP-1 and TP-75 are practical solutions for load cell protection. For line-powered equipment, the Tripp-Lite ISOBLOK® and ISOBAR® or Rice Lake's EL225 or EL226 are the most effective protection against voltage spikes.



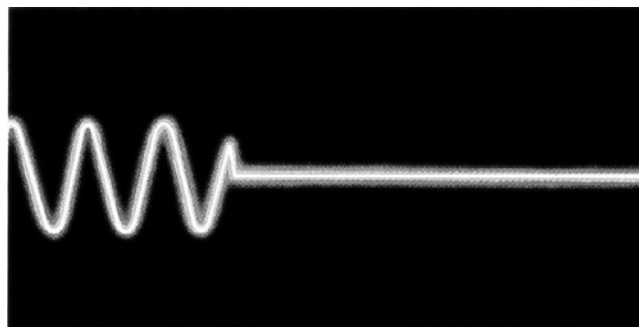
Brownouts

Brownouts are prolonged voltage dips of as much as 15%, lasting from several hours to several days. This condition is initiated by local power companies during hours of unusually high demands. Brownouts create many forms of abnormal behavior. The only way to safeguard the operation of critical equipment is to bring the powerline voltage back up to normal specifications. The SOLA MCR series of line voltage regulators, MCR070, MCR150 and MCR250; the Sola SK Series or Eaton uninterruptible power systems can eliminate the problems associated with brownout conditions.



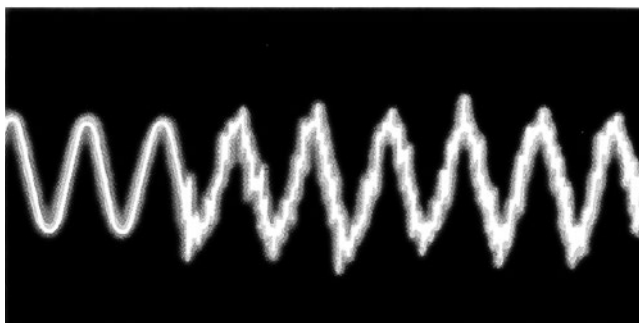
Blackouts

The ultimate power problem! The only way to keep critical electrical equipment running during a blackout is to provide a new supply of power either from batteries or generators. The Sola SK Series or Eaton uninterruptible power system are our answer for battery-supplied electrical power.



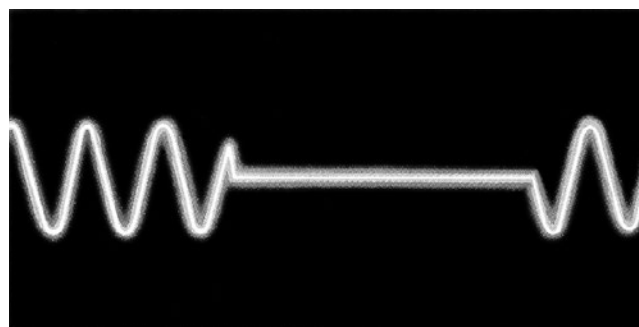
Electrical Noise

Noise is a disturbance of electrical power caused by distant lightning, radio transmitters, welding equipment, electrical switching equipment and poor brush contact on motors and other electronic devices utilizing switching power supplies. One solution is to prevent noise from entering equipment by filtering the powerline input. The Tripp-Lite ISOBLOK and ISOBAR, or Rice Lake's EL225 or EL226 will effectively filter most electrical noise problems. In severe cases, the use of uninterruptible power systems such as Eaton and Sola S1K Series are recommended.



Dropouts

A dropout is a temporary loss of electrical power normally caused by utility and maintenance switching functions where break-before-make switching strategies are used. This simply means the old source of power is disconnected momentarily prior to the connection of the new power source. Your local utility company may be the most common source of this type of disturbance, causing many problems—notably computer lockups, software errors, equipment resets and diagnostic self-tests. The SOLA MCR series of regulators; MCR070, MCR150 and MCR250 are available to deal with short-term dropouts (less than three milliseconds). For longer-lasting protection, Eaton and Sola SK Series uninterruptible power systems are recommended.



Transient Protection AC, DC, Series and Parallel

AC Protection

AC protection is designed to filter voltage spikes and electrical noise from AC wall receptacles providing power to sensitive microprocessor-based equipment such as computers, printers and indicators. Clamping voltages typically are set to 140 volts AC rms and peak current handling capacities are near 6,000 amps.

DC Protection

DC protection is designed to filter voltage spikes and electrical noise from load cell cables, and both RS-232 and 20 milliamp serial communication lines protecting indicators, communications interfaces and computers.

Parallel Protection

Parallel protection is provided by “diverting” or “bypassing” elements that attempt to quickly change the direction of the voltage spike, typically toward earth ground. Examples of “diverting” type elements are gas tubes, MOVs and Transzorbs™. In a parallel-type transient protector, the equipment to be protected is not removed from the line in the event of a protector damaging voltage spike, leaving the possibility of a second catastrophic voltage spike to enter the unprotected equipment.

Series Protection

Series protection is provided by “blocking” type elements that buffer the equipment to be protected from the line voltage available at the wall receptacle. Examples of “blocking” type protective elements that are used in series-type transient protectors are fuses, circuit breakers, common mode coils and inductors. In addition, series-type protectors will utilize “diverting” elements used in parallel protectors. In the series type of transient protector, the equipment to be protected is generally removed from the line source in the event of a damaging transient or surge.

Rice Lake Weighing Systems endorses only series type AC and DC transient protectors. The additional performance and protection they provide are substantial compared to parallel type counterparts.

A Message About Grounds...

A good ground is essential for any successful transient protection scheme. However, simply driving a copper ground rod is not enough. The conductivity of the soil can vary seasonally, particularly if the local water table rises and falls with the season. An adequate ground in spring, when the water table is high, may not be adequate in late summer when the water table is low (and thunderstorms are common). Check the resistivity of your ground regularly throughout the year. If problems appear, check with your local utility about alternate grounding techniques.

Type of Disturbance	AC Line Disturbance Solutions			
	TRANSIENT PROTECTORS	VOLTAGE REGULATORS	UNINTERRUPTIBLE POWER SYSTEMS	
	ISOBLOK/ISOBAR Our Best - EL225, EL226	MCR Series	Sola Series	Eaton
SURGE	*	✓	✓	✓
DIP		✓	✓	✓
BROWNOUT		✓	✓	✓
DROPOUT		✓	✓	✓
BLACKOUT			✓	✓
SPIKES	✓		✓	✓
NOISE EMI/RFI	✓		✓	✓

** Will provide some protection against surges; however, we recommend that transient protectors be used on lines where spikes, noise and interference occur.*

Our Policy

Rice Lake Weighing Systems recommends the installation of AC and/or DC transient protection, which is effective in significantly reducing both the frequency and degree of damage caused by AC and/or DC transient voltage occurrences. However, transient protection devices will not eliminate all damage caused by transient voltage. Rice Lake Weighing Systems does not warrant or guarantee any transient protection device against damage or repair or any scale-related or other electrical/electronic device, which is intended to be protected by any transient protection device. No other warranty or guarantees—express or implied—contrary to this written policy are supported or acknowledged by Rice Lake Weighing Systems.

TP232 RS-232

Serial Surge Protector

POWER
CONDITIONING



Approvals



Part Number/Price

Part #	Description	Est. Weight	Price
69201	RS-232 transient serial protection TP232 high energy surge protector	0.42 lb	\$187.00

Options/Accessories

Part #	Description	Price
17778	12 in ground strap, copper braid	\$22.00
17781	24 in ground strap, copper braid	\$22.00
69516	Additional installation manual	\$6.00



1280 Enterprise Indicator



TP232



LaserLight3 Remote Display

Standard Features

- Two metal mounting brackets
- Three stages of protection: Gas discharge tube, series resistor and transient voltage suppressor (TVS)
- Two terminal posts for ground
- RS-232 high energy surge protector
- Terminal blocks for transmit, receive, request to send, clear to send and signal ground
- Safe for use with computers and PLCs
- Also works with RS-485, RS-422 and 20 mA

Applications

- Indicators
- Remote displays
- Printers
- Computers
- PLC

Specifications

Clamping Voltage (Stage One):

72 VDC minimum, 108 VDC maximum

Series Resistance (Stage Two):

2.7 ohm

Clamping Voltage (Stage Three):

14.3V minimum, 15.7V maximum

Temperature:

Operating Range
0 °F to 122 °F (-18 °C to 50 °C)

Clamping Time:

Less than 5 < 10-9 seconds

Connectors:

Five-position terminal blocks

Dimensions:

(L × W × H)
Approximately 4.5 × 3.3 × 1.8 in

Approvals:

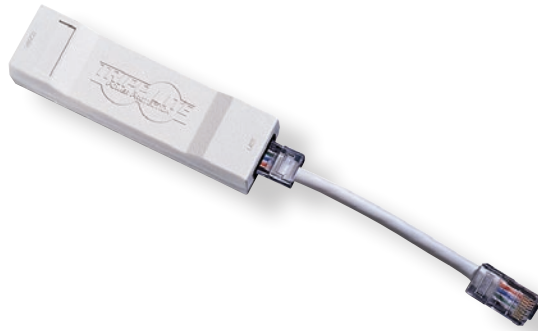
CE marked

Warranty:

One-year limited

Tripp-Lite DNET1

Ethernet Surge Suppressor



Part Number/Price

Part #	Description	Est. Weight	Price
72682	DNET1 Ethernet surge suppressor	1 lb	\$80.00

Standard Features

- RJ45 input and output connections
- Five-inch Ethernet patch cable enables ideal protection placed as close as possible to the point of use
- Six-inch heavy gauge lead connects to designated grounding lugs on protected equipment
- Surge suppression utilizing high-speed avalanche diodes divert excess energies on the network to ground

Specifications

Interface Type:

RJ45

Application:

100 Base-T, 10 Base-T, Token Ring, AS400/Sys3x, RS-422. Ideal for NICs, terminals, hubs, MAUs, LAN equipment. RJ11/45-compatible. RJ45 cable included.

Lines Protected:

1 to 8

Peak Pulse Clamping Voltage:

7.5V

Maximum Current:

750 amps

Warranty:

One-year limited

LCP-1 DC

Transient Protector



Standard Features

- Low cost, non-serviceable
- Effective series protection for strain gauge transducers
- Encapsulated circuitry ensures positive protection against fungus or corrosion on boards
- Two nylon strain reliefs for 0.187 to 0.312 in (4.7 to 7.9 mm) diameter cable

Specifications

Protection Type:

Four-channel series type with separate shield

Maximum Excitation Voltage Rate:

18 VDC or 18 VAC

Clamping Voltage:

75 VDC or 75 VAC

Clamping Time:

< 100 nanoseconds typical

Peak Surge Currents:

5,000 amps any line to ground and 5,000 amps excitation to excitation

Maximum Serial Transmission Rate:

30 Kbaud

Grounding:

Through a 0.25 in lug to a 20 ft insulated #10 AWG ground wire provided

Cable Fitting:

(2) Standard nylon strain relief for 0.187 to 0.312 in diameter cable

Enclosure:

Chemically-resistant PVC. This device, for outdoor or indoor service, is not intended for washdown service (NEMA 4) or for submersion (NEMA 6). Optional NEMA 4X available.

Operating Temperature:

14 °F to 104 °F (-10 °C to 40 °C) consistent with NTEP guidelines

Leakage:

7,500 M ohm minimum

Dimensions:

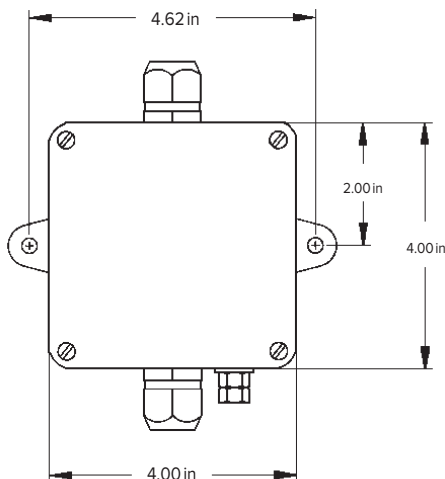
(L x W x H)
4.0 x 4.0 x 2.50 in

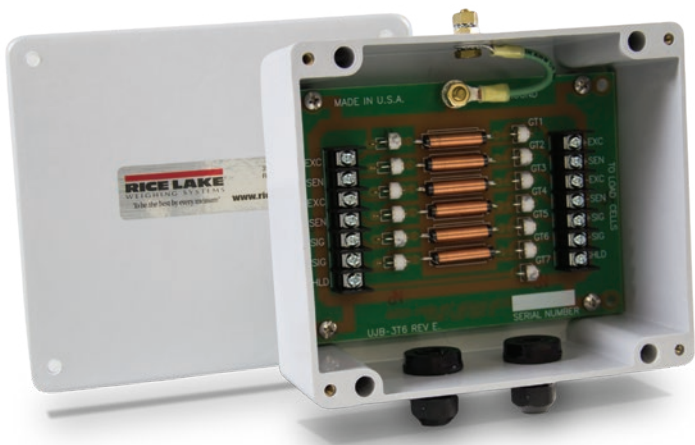
Warranty:

One-year limited

Part Number/Price

Part #	Description	Est. Weight	Price
21143	LCP-1 DC with cable compression fittings	2 lb	\$210.00





Standard Features

- Protects load cells from voltage transients
- Compatible with signals down to 1 μ V per grad
- Factory serviceable
- Full six-wire with shield protection
- #6 SEMS screw type; accepts spade lugs, tinned leads or bare wires up to #12 AWG
- Up to eight parallel or summed load cells

Applications

- Installations exposed to significant transients
- Protects serial communication lines

Specifications

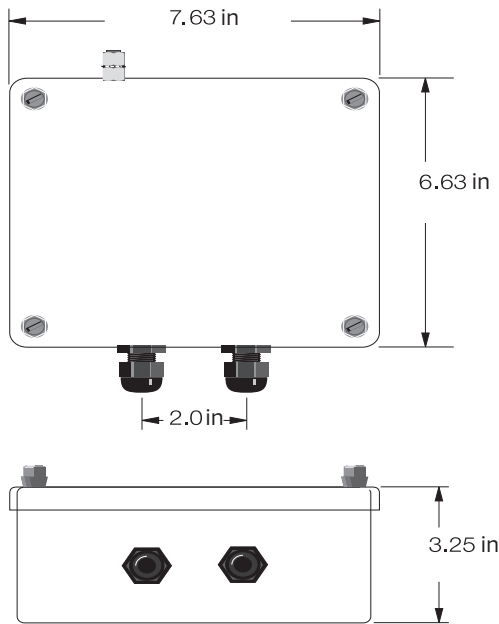
- Protection Type:**
Six-wire type with separate shield
- Maximum Excitation Voltage:**
20 VDC or 20 VAC
- Clamping Voltage:**
75 VDC or 75 VAC
- Clamping Time:**
75 VDC Stages <100 nanoseconds typical
- Peak Surge Currents:**
75 VDC Stage, 5,000 amps
- Maximum Serial Transmission Rate:**
50K baud
- Series Resistance:**
0.219 ohm typical
- Series Inductance:**
110 μ H typical
- Grounding:**
20 ft insulated #10 AWG wire
- Cable Fitting:**
Two nylon strain relief for 0.079 to 0.236 in diameter cable
- Enclosure:**
NEMA Type 4X, maximum 40 psi washdown
Fiberglass Reinforced Polyester (FRP)
- Temperature Range:**
Operating :
4 °F to 104 °F (-10 °C to 40 °C)
- Circuit Board:**
6.75 \times 4.75 in with anti-fungal coating
- Dimensions:**
(L \times W \times H)
7.63 \times 6.63 \times 3.25 in
- Warranty:**
One-year limited

Part Number/Price

Part #	Description	Est. Weight	Price
21134	UJB3T6 DC	4 lb	\$495.00

Options/Accessories

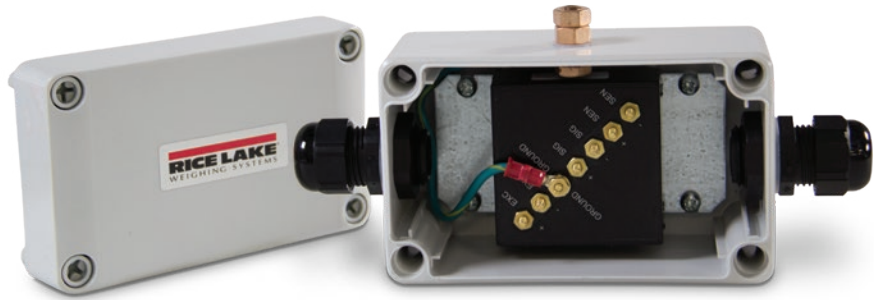
Part #	Description	Price
21135	UJB3T6 DC six-channel load cell transient protector, board only	\$285.00



TP75 DC

DC Transient Protector

POWER
CONDITIONING



Standard Features

- Protects load cells and indicators from voltage transients
- Avalanche diode design
- Full six-wire with shield protection
- NEMA Type 4X enclosure
- Unlimited number of parallel load cells; up to eight in series
- Terminal lugs provided

Applications

- Tank, bin and hopper scales
- Truck and railroad scales
- Suitable for outdoor use

Specifications

Protection Type:

Six-wire type with separate shield

Maximum Excitation Voltage:

22.8 VDC

Response Time:

Five nanoseconds

Peak Surge Currents:

100 amps

Grounding:

10 AWG wire or larger (not provided)

Cable Fitting:

Two nylon strain relief for 0.187 to 0.312 in diameter cable

Enclosure:

Impact-resistant polycarbonate NEMA Type 4X, maximum 40 psi washdown

Temperature:

Operating:
-4 °F to 149 °F (-20 °C to 65 °C)

Dimensions:

(L × W × H)
3.16 × 2.20 × 1.18 in

Warranty:

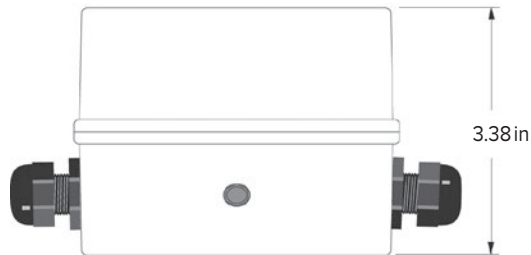
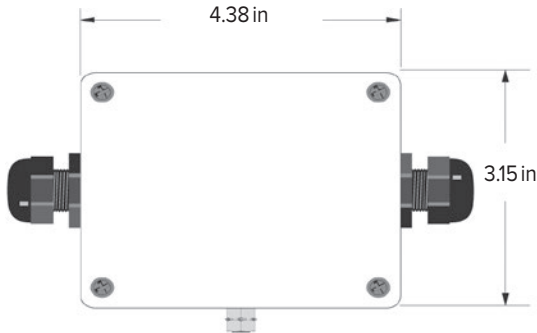
One-year limited

Part Number/Price

Part #	Description	Est. Weight	Price
33185	TP75, load cell protector and mounting hardware	2 lb	\$335.00

Options/Accessories

Part #	Description	Price
31164	TP75 DC transient protection, board only, with labels	\$260.00





Standard Features

- Two outlets, direct plug-in
- LED indicator for power on
- LED indicator for protection circuitry
- UL1449 listed at 330 volts
- Mounting clamp assures positive connection

Specifications

Clamp Voltage:
140 V rms

Peak Surge Current:
6,500 amps

Clamping Time:
Less than five nanoseconds

Input Voltage:
120 VAC

Maximum Current:
15 amps

Maximum Power:
1,875 watts

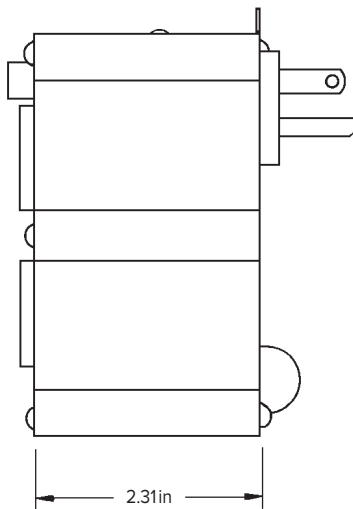
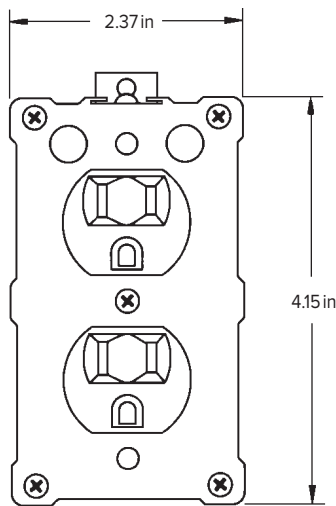
Noise Suppression:
Frequency Attenuation
50 KHz > 20 db
150 KHz > 40 db
1 MHz > 80 db
> 6 MHz > 30 db

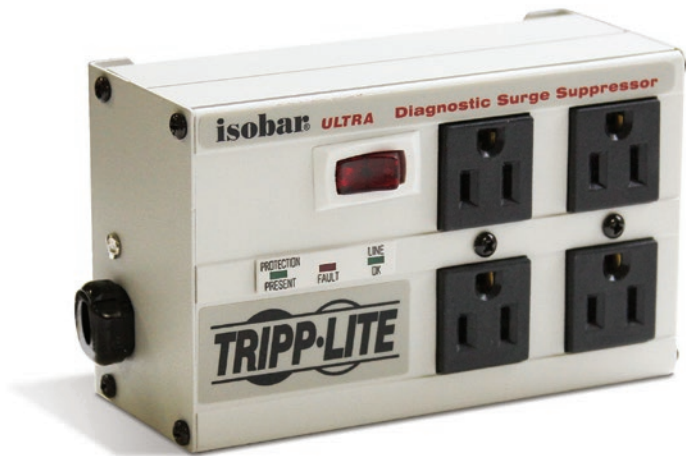
Dimensions:
(L x W x H)
4.15 x 2.37 x 2.31 in

Weight:
Approximately 1 lb

Part Number/Price

Part #	Description	Est. Weight	Price
21145	ISOBLOK® AC two-outlet transient protector	1 lb	\$125.00





Standard Features

- Four outlets
- Six-foot cord with grounded three-prong plug
- Lighted on/off switch
- Circuit breaker protected
- Multiple filter design prevents the different components of your system from interfering with each other
- UL1449 listed at 330 volts
- Exclusive isolated filter banks prevent equipment interaction
- ISOBAR cascade circuitry allows you to choose more protection for your most sensitive equipment and a lesser degree of protection for equipment with more tolerance

Specifications

Input Voltage:
120 VAC

Maximum Current:
15 amps

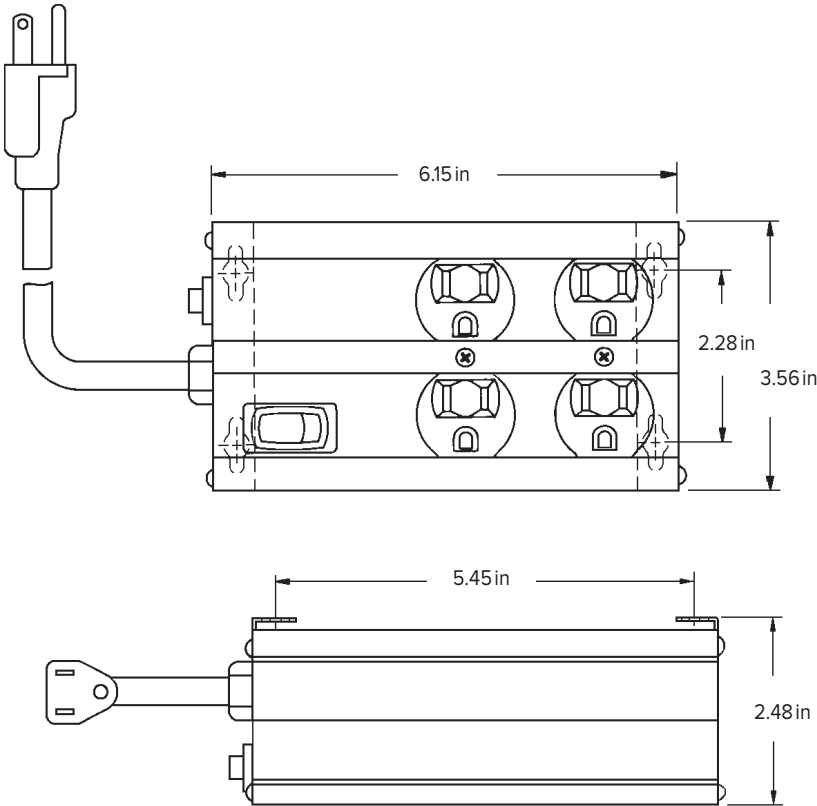
Maximum Power:
1,875 watts

Noise Suppression:
Frequency Attenuation
50 KHz > 20 db
150 KHz > 40 db
1 MHz > 80 db
> 6 MHz > 30 db

Dimensions:
(L x W x H)
6.15 x 3.56 x 2.48 in

Part Number/Price

Part #	Description	Est. Weight	Price
21146	ISOBAR® AC four-outlet transient protector, 115 VAC	2 lb	\$220.00
36663	ISOBAR 230 VAC Euro	3 lb	\$195.00





Part Number/Price

Part #	Description	Est. Weight	Price
21136	EL226 AC two-outlet transient protector, 115 VAC	6 lb	\$370.00

Standard Features

- Duplex receptacle
- 20 ft ground cable
- Factory serviceable
- 9 ft cord with three-prong plug
- Plugs into any grounded three-prong outlet
- Indicator light shows protection is secure
- Excellent as a prefilter for voltage regulators
- Reliability and quality top-of-the-line performance
- Shielded line cord for protection against induced transients
- Positive proven protection for scales, computers and printers
- Convenient mounting holes; can be mounted on any surface

Specifications

Operating Voltage:

120 VAC 50/60 Hz, nominal

Maximum Current:

10 A rms instantaneous

7.5 A rms continuous

Clamping Time:

Less than three to five nanoseconds

EMI/RFI Protection:

13 stages

Protection Type:

13-stage filters out both common and normal mode transients

Grounding:

20 ft insulated #10 AWG wire provided

Enclosure:

Stainless steel

Operating Temperature:

14 °F to 104 °F (-10 °C to 40 °C)

Circuit Board:

Fiberglass reinforced 4-glass epoxy

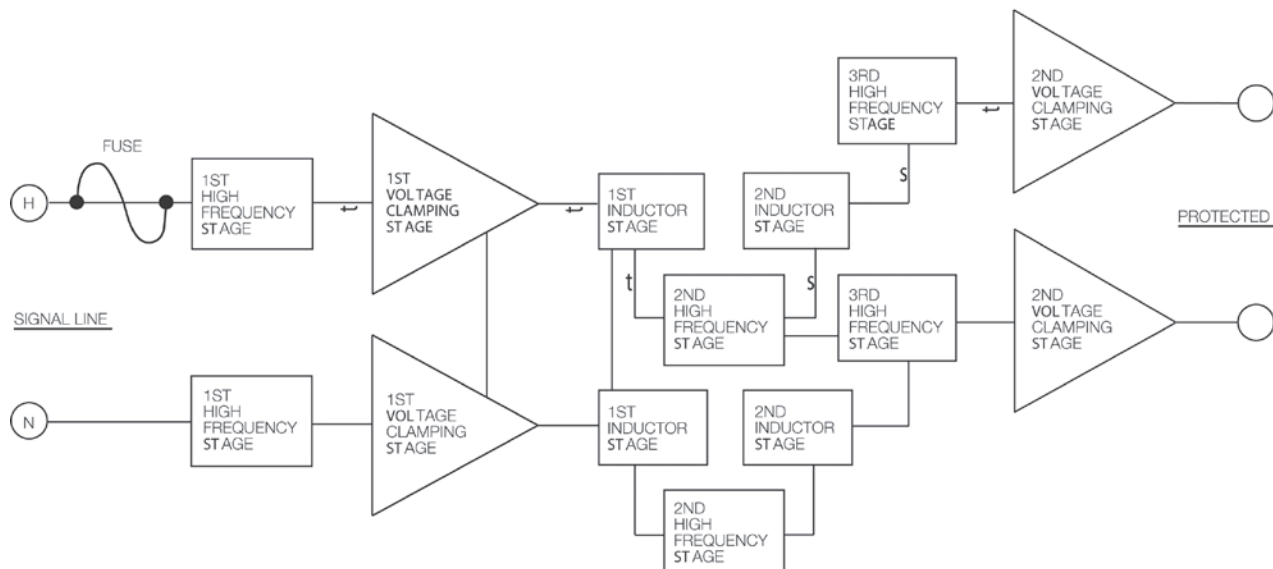
Dimensions:

(L × W × H)

8.00 × 6.00 × 2.50 in

Warranty:

One-year limited



EL225-4

AC Transient Protector



Part Number/Price

Part #	Description	Est. Weight	Price
21142	EL225-4 AC transient protector (chassis mount) 115 VAC	1 lb	\$285.00

Standard Features

- Dedicated series transient protection
- Bidirectional design reduces noise on surrounding lines

Specifications

Maximum Current:

2 amps continuous

Trip Point:

130 VAC rms

Clamping Time:

Less than five nanoseconds

EMI/RFI Protection:

Nine stages

Protection Type:

Nine-stage series type filters out both common and normal mode transients

Grounding:

20 ft insulated #10 AWG wire provided

Operating Temperature:

14 °F to 104 °F (-10 °C to 40 °C)

Dimensions:

(L × W × H)
4.01 × 2.05 × 2.00 in

Warranty:

One-year limited

Sola MCR Series

Power Regulator



Standard Features

- Automatic overload protection
- Convenient lighted on/off switches
- Available in 70, 150 and 250VA outputs
- Offered in standard 120 volt, 60 Hz models
- Two duplex receptacles allow several pieces of equipment to economically share the same source of regulated power

Specifications

Input:

Voltage: 120V
Input Voltage Range: +10% to -20% of input nominal voltage

Control:

Lighted Enable Switch

Output:

Voltage: 120V
Voltage Regulation: ±3% for an input line variation of +10% to -20%. Output will remain within NEMA voltage specifications for input voltages as low as 65% of nominal. No loss of output for line loss of three milliseconds.
Harmonic Distortion: Less than 3% total RMS content at full load

Noise Reduction:

Common mode noise rejection exceeds 120 dB (DC to 1 MHz)
Transverse mode noise rejection exceeds 60 dB (10 KHz to 1 MHz)

Protection:

Input: Surge suppression module
Output: Surge suppression module and ferroresonant technology suppresses ANSI/IEEE C62.41-1980 Class A and B waveforms to safe levels (formerly IEEE 587-1980)

Efficiency:

90% at full load (typical)

Reliability:

25-year continuous life, average

Operating Temperature:

-4 °F to 122 °F (-20 °C to 50 °C)

Construction:

Cruciform-type construction with precision die-cut shunts, gaps and spacing between windings

Approvals:

UL listed to UL1012
CSA certified to CSA C22.2-66

Dimensions:

(L × W × H)
9.25 × 6.75 × 6.25 in

Warranty:

One-year limited

Approvals



Part Number/Price

Part #	Description	Est. Weight	Price
21155	Sola MCR 070 regulator 120 VAC power 70 VA power	16 lb	\$825.00
21156	Sola MCR 150 AC power regulator, 150 VA	21 lb	\$1,595.00
21157	Sola MCR 250 AC power regulator, 250 VA	29 lb	\$1,995.00

Tripp-Lite PV Series

Power Convertor

POWER
CONDITIONING



Part Number/Price

Part #	Description	Est. Weight	Price
79679	PV-375	3 lb	\$225.00

Standard Features

- Two 5-15R outlets
- Convenient on/off switch
- Transistorized and solid state for long life and quiet operation
- Three-foot cord with DC plug

Specifications

- Input VDC:**
12V
- Output VAC:**
120 VAC
- Frequency Hz:**
60 Hz
- Maximum Output Continuous:**
375 watts
- Maximum Output Intermittent:**
375 watts
- Input Amp - No Load:**
0.65 amps
- Input Amp - Full load:**
40 amps
- Enclosure:**
Non-sealed aluminum
- Dimensions:**
(L x W x H)
7.00 x 4.25 x 2.00 in
- Warranty:**
One-year limited

Tripp-Lite LC1200

Power Regulator



Part Number/Price

Part #	Description	Est. Weight	Price
70726	LC1200, 120 VAC power regulator	11 lb	\$525.00

Standard Features

- Maintains usable 120V nominal output during brownouts as low as 87V and overvoltages as high as 140V
- 1,200 watts output power rating supports heavy 120V loads up to 10 amps
- Network grade surge suppression rated at 1,200 joules
- Complete EMI/RFI noise filtering
- Seven diagnostic LEDs indicate input voltage levels, surge suppression status and line fault conditions
- Four protected NEMA Type 5-15R outlets
- Six-foot AC power cord with standard NEMA 5 - 15P input plug

Specifications

- Output Wattage (continuous):**
1,200
- Voltage/Frequency:**
120/60
- Cordset:**
6 ft
- AC Receptacles:**
Four NEMA 5-15R
- LED Indicators:**
Seven (very high voltage, high voltage, normal voltage, low voltage, very low voltage, line fault, line OK)
- Surge Energy Rating (Joules):**
1,200
- High Frequency Noise Suppression (@ 1 MHz):**
80 dB
- Dimensions:**
(L x W x H)
6.75 x 5.75 x 6.75 in
- Warranty:**
One-year limited

NOTE: LC models have isolated filter banks. Each duplex outlet pair is filtered from the rest to prevent interference between connected equipment.

Sola S1K/S3K

Uninterruptible Power Supply (UPS)

POWER
CONDITIONING



Standard Features

- Protects against most adverse power conditions, including: frequency variations, surge, noise, blackouts, lightning, spike, brownouts, and over and under voltages
- Data-line surge protection for phone or network included on every unit
- Greater uptime with intelligent power management, full-sequence battery testing and two-level overload protection

Specifications

Input Voltage Range (for online operation):
115 VAC: +20%/-25%

Operating Frequency (online):
50/60 Hz \pm 1 Hz auto sensing

Overload Capacity:
120% \pm 10% (Three minutes on line mode, 10 seconds on battery)

Maximum Output Continuous:
375 watts

Transfer Time:
Four ms typical

On Battery Voltage:
115 VAC: 115 VAC rms \pm 10%

Output Voltage Waveform:
Step sine wave at 115 V

Output Protection:
Electronically limited

Input Protection:
Circuit breaker

Recharge Time (to 95% capacity):
Four hours

Lightning & Surge Protection:
ANSI/IEEE C62.41 categories A & B, IEC801.4, 801.5

Safety Certification:
115 VAC: UL listed to 1778, designed to meet UL497A, CSA certified to CSAC22.2 No. 1071

EMI Compliance:
115 VAC: FCC Class B

Data Line Protection:
115 VAC: fax/modem, network

Indicators:
Online/utility fail/overload/replace battery

Audible Alarms:
Utility fail/overload/replace battery

Dimensions:
(L x W x H)
S1K: 5.3 x 3.8 x 12.6 in
S2K: 8.3 x 5.5 x 17.2 in

Warranty:
Two-year limited

Approvals



Part Number/Price

Part #	Model #	Capacity (Va/Watts)	Volts, Frequency In/Out	Typical Backup (Minutes)	Est. Weight	Input Plug/Output Receptacle	Price
110812	520 VA S1K	520	115/115,50/60 Hz	15	12 lb	5-15P(4) 5-15R	\$325.00
203635	1,000 VA S3K	1,000/750	115/115,50/60 Hz	18	39 lb	5-15P(4) 5-15R	\$2,395.00

Note: 230 VAC versions available. Consult factory.

Note: Air around the above units must be free of dust, chemicals or other materials that corrode or contaminate

Eaton 3S/5S

Uninterruptible Power Supply (UPS)



Standard Features

- Five outlets with battery back up and surge protection
- Coax surge protection (5S)
- Replaceable battery

Specifications

Input Voltage Range (for online operation):
89 to 151 VAC (3S)
93 to 138 VAC (5S)

Operating Frequency (online):
50/60 Hz out sensing

UPS and Surge Protection:
Both models

Safety Markings:
UL, CUL, NOM

Data Line Protection:
Yes

Indicators:
Power, LED

Alarms:
No

Dimensions:
(L x W x H)
3S: 3.4 x 5.5 x 13.2 in
5S: 9.8 x 3.4 x 10.2 in

Warranty:
Three-year limited

Part Number/Price

Part #	Model #	Capacity (Va/Watts)	Volts, Frequency In/Out	Est. Weight	Input Plug/Output Receptacle	Price
154127	Eaton 3S	550/330	120 V	10 lb	NEMA Type 5-15R	\$165.00
154128	Eaton 5S	700/450	120 V	16 lb	NEMA Type 5-15R	\$350.00